



STI BULLETIN ONLINE

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Featured Article

The Changing Face of NTRS



The [NASA Technical Report Server \(NTRS\)](#) has been providing Web-based aeronautics and space scientific and technical information since 1995, when it was established to provide access to all NASA Center library document collections. With the closing of individual Technical Report Servers (TRSs) at some Centers in 2003 and the development of a new NASA Aeronautics and Space Database (see [From the Program Office](#)) for the NASA community, the NTRS will soon be the public's

portal for NASA STI.

Launched this April, the NTRS has a totally new look. An easy-to-use interface provides two search options and a browse option for access to STI. If you choose the Simple Search, you only have to enter some keywords to gain access to the bibliographic records of NASA publications. If you want to use a more sophisticated approach, the Advanced Search lets you specify what you want to search for in title, author, date, number, and abstract fields. The Advanced Search will also give you broader access: you can search non-NASA as well as NASA collections. The Browse function lets you look at these collections directly.

But there is more to the new NTRS than meets the eye. In upgrading the NTRS, NASA added a new capability: metadata harvesting. Metadata is data about data, i.e., the information you usually see in your search results. Harvesting is something that may be new to many of us. In metadata harvesting, the metadata records are pulled from the originating archives and indexed at the local service provider. The full-text files remain at the originating archives. The goal of metadata harvesting is to provide the user with more reliable, integrated, and consistent searching experience than is possible through distributed searching. For more information, see the [Open Archives Initiative Protocol for Metadata Harvesting \(OAI-PMH\)](#). NTRS harvests metadata from

NASA Centers, research projects, and affiliated institutes. It also harvests from non-NASA sources such as the Physics E-print Server, BioMed Central, the Energy Citation Database, and Aeronautical Research Committee reports from the MAGiC Project. In all, NTRS provides access to over 540,000 metadata records and 270,000 full-text reports, updated on a weekly basis.

FOCUS ON...

Robotics



On June 10, NASA's Mars Exploration Rover Project kicked off by launching Spirit, the first of two unique robotic "geologists." Spirit will roam a landing area on Mars that shows evidence of a wet history. The rover will examine rocks and soil for clues to whether the site may have been a hospitable place for life. The second rover, Opportunity, scheduled for a July 2 launch, will examine a site on the opposite side of Mars. Together, the identical rovers will be able to see sharper images, explore farther and examine rocks better than anything that has ever landed on the Red Planet.

Between now and the time these rovers land and begin collecting data early next year, you can brush up on your robotics or find material for the many education and outreach efforts NASA will be conducting. We have provided a list of recently added publications from the NASA Aeronautics and Space Database together with their Document IDs.

Robotics Citations

General

Pedersen, L.; Kortenkamp, D.; Wettergreen, D.; Nourbakhsh, I.; Korsmeyer, David. A Survey of Space Robotics. Document ID: 20030054507.

Troutman, Patrick A.; Bethke, Kristen; Stillwagen, Fred; Caldwell, Darrell L., Jr.; Manvi, Ram; Strickland, Chris; Krizan, Shawn A. Revolutionary Concepts for Human Outer Planet Exploration (HOPE). Document ID: 20030006858.

Landis, Geoffrey A. Robots and Humans: Synergy in Planetary Exploration. Document ID: 20030006862 (conference paper); 20030032442 (preprint).

O'Handley, Douglas A. The Next Logical Step — Post ISS. Document ID: 20030006906.

Knuth, Kevin H. Intelligent Machines in the 21st Century: Automating the Processes of Inference and Inquiry. Document ID: 20030022793.

Systems

Guidance and Control

Bernstein, Daniel S.; Zilberstein, Shlomo. Reinforcement Learning for Weakly—Coupled MDPs and an Application to Planetary Rover Control; Final Report. Document ID: 20030034817.

Zilberstein, Shlomo; Morris, Robert. Self-Directed Cooperative Planetary Rovers; Final Report. Document ID: 20030034825.

Zilberstein, Shlomo; Washington, Richard; Bernstein, Daniel S.; Mouaddib, Abdel-Ilah; Morris, Robert. Decision-Theoretic Control of Planetary Rovers; Final Report. Document ID: 20030034662.

Viveash, Jacqueline; White, Joanna; Boughton, Jenny; King, Stuart; Kaye, Martin. Remote Control of Vehicles. Document ID: 20030019096.

Clancey, William J.; Sierhuis, Maarten; Kaskiris, Charis; vanHoof, Ron. Advantages of Brahms for Specifying and Implementing a Multiagent Human—Robotic Exploration System. Document ID: 20030033849.

Trimble, Jay. Human Centered Design and Development for NASA's MerBoard. Document ID: 20030025284.

Bias, M. Bernardine; Lemai, Solange; Muscettola, Nicola; Korsmeyer, David; Korsmeyer, David; Korsmeyer, David; Korsmeyer, David. A Real-Time Rover Executive based On Model-Based Reactive Planning. Document ID: 20030018864.

Russell, Daniel M.; Trimble, Jay; Wales, Roxana; Clancy, Daniel; Clancy, Daniel; Clancy, Daniel; Clancy, Daniel. Two Paths from the Same Place: Task Driven and Human Centered Evolution of a Group Information SurfaceDocument ID: 20030018912.

Sierhuis, Maarten; Clancey, William J.; Seah, Chin; Trimble, Jay P.; Sims, Michael H. Modeling and Simulation for Mission Operations Work System Design. Document ID: 20030021664.

Power and Propulsion

Elliott, John O.; Lipinski, Ronald J.; Poston, David I. Mission Concept for a Nuclear Reactor—Powered Mars Cryobot Lander. Document ID:

20030006801.

Elliott, John O.; Lipinski, Ronald J.; Poston, David I. Design Concept for a Nuclear Reactor—Powered Mars Rover. Document ID: 20030006804.

Thieme, Lanny G.; Schreiber, Jeffrey. G. NASA GRC Stirling Technology Development Overview. Document ID: 20030006832.

Baird, Russell S.; Sanders, Gerald B.; Simon, Thomas M. ISRU Development Strategy and Recent Activities to Support Near and Far Term Missions. Document ID: 20030006890.

Boucher, Dale S.; Richard, Jim; Dupuis, Erick. The Development of ISRU and ISSE Technologies Leveraging Canadian Mining Expertise. Document ID: 20030006896.

Baird, Russell S.; Sanders, Gerald; Simon, Thomas; McCurdy, Kerri. ISRU Reactant, Fuel Cell Based Power Plant for Robotic and Human Mobile Exploration Applications. Document ID: 20030006897.

Temperature

Novak, Keith S.; Phillips, Charles J.; Birur, Gajanana C.; Sunada, Eric T.; Pauken, Michael T. Development of a Thermal Control Architecture for the Mars Exploration Rovers. Document ID: 20030006783.

Ganapathi, Gani B.; Birur, Gajanana C.; Tsuyuki, Glenn T.; McGrath, Paul L.; Patzold, Jack D. Active Heat Rejection System on Mars Exploration Rover — Design Changes from Mars Pathfinder. Document ID: 20030006784.

Swanson, Theodore D.; Birur, Gajanana C. NASA Thermal Control Technologies for Robotic Spacecraft. Document ID: 20030031332.

Hearing

Okuno, Hiroshi G.; Nakadai, Kazuhiro. Active audition for humanoid robots that can listen to three simultaneous talkers. Document ID: 20030026188.

Applications

Data Collection

Mondal, S.; Sattar, T. P.; Bridge, B. Acquisition of Time of Flight Diffraction Data by Mobile Robots. Document ID: 20030027689.

Glass, B.; Briggs, G. Evaluation of Human vs. Teleoperated Robotic Performance in Field Geology Tasks at a Mars Analog Site. Document ID: 20030032439.

Reconnaissance and Surveillance

Young, Stuart H.; Scanlon, Michael V. Detection and Localization with an Acoustic Array on a Small Robotic Platform in Urban Environments; Progress Report. Document ID: 20030032920.

Manufacturing

Smith, J. A. Locating LCD Glass for Robotic Handling. Document ID: 20030027793.

DEPARTMENTS

From the Users

This department is for you! We welcome your [contributions](#) and [comments](#). Send them to us and we will publish them in the next issue.

From the Program Office

New NASA Technical Report Server (NTRS)

The new NTRS was made available for educators, researchers, scholars, and the public in April 2003. The NTRS provides access to NASA — generated and — sponsored scientific and technical literature. To further enhance its aerospace collection, the new NTRS includes reports and articles from non-NASA aerospace sources as well: the Physics e-print server (arXiv), BioMed Central, the Energy Citation Database (from the U.S. Department of Energy), and Aeronautical Research Committee reports from the MAGiC project. In total, NTRS provides access to over 540,000 records and numerous full-text reports. All information provided by NTRS is "unclassified, unlimited" and updated on a regular basis. The publications cover all aspects of aerospace — related research, and range from the first National Advisory Committee for Aeronautics (NACA) reports first published in 1917 to the most recently published NASA research. See <http://ntrs.nasa.gov>.

Publication News

Publication News

Current

The Neurolab Spacelab Mission: Neuroscience Research in Space, NASA SP-2003-553, edited by Jay C. Buckey, Jr. and Jerry L. Homick, has been published by Johnson Space Center. The 16-day Neurolab mission, devoted to studies of the brain and nervous system, was conducted in the Spacelab aboard Space Shuttle flight STS-90. This book presents mission results in the form of scientific reports from individual investigator teams and technical reports on mission-specific procedures and equipment. Captioned illustrations (many in color), extensive references, and a detailed index enhance the utility of the book.

History

Memoirs of an Aeronautical Engineer: Flight Tests at Ames Research Center: 1940-1970 by Seth B. Anderson (NASA SP-2002-4526). This is the newest monograph in the NASA History collection, and features extensive insight into most of the major programs carried out at Ames Research Center during a thirty-year span. Over half of the monograph is devoted to an excellent pictorial history of the different aircraft that Mr. Anderson worked on. To order please send a self-addressed stamped envelope (\$3.95 domestic) to NASA Headquarters Information Center, Code CI-4, 300 E St., SW, Washington, DC 20546.

Celebrating a Century of Flight (NASA SP-2002-09-511-HQ). This very attractive and informative 32-page, 8 1/2 x 11", color brochure was edited by Tony Springer, the NASA centennial of flight coordinator, with input from the NASA History Office and many other organizations including the U.S. Air Force and the U.S. Centennial of Flight Commission. It was designed by Melissa Kennedy. It is an excellent introduction to aerospace history since the Wright brothers' historic flight in December 1903. To request a hard copy of this brochure, please send a self-addressed 9x12" envelope with appropriate postage (typically \$1.06 within the U.S., \$1.35 for Canada, and \$3.20 for overseas. International customers are asked to purchase U.S. postage through an outlet such as www.stampsonline.com) to the NASA Headquarters Information Center, Code CI-4, Washington, DC 20546. An electronic PDF version is also available online by clicking [here](#).

[Flight Research at Ames, 1940-1997](#) (NASA SP-3300, 1998) by Paul F. Borchers, James A. Franklin, and Jay W. Fletcher. A richly illustrated, monograph-length publication, this is a very informative work on aeronautics research in general. A special thanks to Chris Gamble for formatting this book for the Web.

[The Planetary Quarantine Program: Origins and Achievements, 1956-1973](#) (NASA SP-4902, 1974).

By Charles R. Phillips. A thin, but significant, volume on a topic of considerable interest over the years. Thanks to Chris Gamble for scanning and formatting this book for the Web.

[Engineer in Charge: A History of the Langley Aeronautical Laboratory, 1917-1958](#) (NASA SP-4305, 1987). By James R. Hansen. A well-written, informative Center history of NASA Langley's aeronautical research roots. Special thanks to Chris Gamble for preparing this book for the Web.

[Spaceflight Revolution: NASA Langley Research Center From Sputnik to Apollo](#) (NASA SP-4308, 1995) by James R. Hansen. This volume picks up where *Engineer in Charge* left off by addressing NASA's forays into spaceflight research. Special thanks to Chris Gamble for preparing this book for the Web.

[Exploring the Unknown: Selected Documents in the history of the U.S. Civil Space Program, Volume III: Using Space](#) (NASA SP-4407). This is the third volume in an ongoing series of reference books that are useful for those interested in both space history and space policy. It consists of four chapters of documents with introductory essays. You may also want to see some of the other volumes in this series that are online in a similar format by clicking [here](#). Thanks to Chris Gamble for scanning this resource for the Web.

[Beyond the Ionosphere: Fifty Years of Satellite Communications](#) (NASA SP-4217, 1997), ed. by Andrew J. Butrica. This book is an excellent history of satellite communications, covering the gamut of satellites from Echo 1 to the Global Positioning System, and includes many essays on satellite communications in other countries. A special thanks to Chris Gamble for scanning this book for the Web.

[Aerospace Food Technology](#) (NASA SP-202, 1969). This report is the result of a conference held in 1969 on the subject of food in the aerospace industry. Presentations included are on the different types of food given to astronauts, airline passengers, and naval aquanauts, to name a few. Thanks go to Chris Gamble for formatting this publication for the Web.

[Exploring Space with a Camera](#) (NASA SP-168, 1968). This pictorial report is full of interesting pictures detailing the early exploits of NASA and its satellites. From pictures of clouds to those of the moon and even an impressive collection of photographs taken by astronauts themselves, this resource is worth at least one look. Thanks to Chris Gamble for the scanning and formatting of this publication so that it could be placed on the Web.

[A Historic Meeting at the White House on Human Spaceflight](#) involving President Kennedy and NASA Administrator James Webb on November 20, 1962. This meeting, with a number of other high-level participants, was prompted in part by press reports that NASA was not devoting enough attention to the Apollo lunar landing program and the possible requirement for an additional supplemental appropriation of over \$400 million to NASA's current budget. This meeting is a window into the role that human spaceflight played in international and domestic politics in the early 1960s. It also provides insights into the thinking of high-level government officials about spaceflight, their personal interactions, and the cooperation and conflict of their organizations. The meeting was tape recorded, but the recording was not released until August 2001. It is of relatively high quality when compared to

other presidential recordings from the era, but it is still rather difficult to discern and understand the various voices. This Web site includes the full audio transcription streaming format, the written transcript, and other supporting information. Special thanks to Dwayne A. Day, Glen Swanson, Douglas Ortiz, and Sivram Prasad for their help setting up this site.

[Evolution of the Solar System](#) (NASA SP-345, 1976) by Hannes Alfvén and Gustaf Arrhenius. This is an excellent volume on planetary science. While it includes some scientific equations, it also includes many diagrams and images, and the authors strove to make the material understandable to the educated lay reader. Special thanks to Chris Gamble for scanning and formatting this book for the Web.

[Saturn Illustrated Chronology](#) (MHR-5, Marshall Space Flight Center, fifth edition, 1971) is now available on the Web. This book covers the first 11 years of the Saturn program, from April 1957 through April 1968. Abounding with pictures about the Saturn program, it is a magnificent pictorial chronology of the program that has launched so many NASA spacecraft over the years. Special thanks to Malcolm Munro for all of his hard work in scanning and formatting this beautiful chronology for the Web.

[Apollo 13 Review Board \(a.k.a. Cortright Commission\)](#) is now available online in fully text-searchable PDF files. This is the report issued after the Apollo 13 accident which prevented the mission from landing on the Moon. Thanks to Colin Fries and Sivram Prasad of the History Office for their help in scanning and formatting this report for the Web.

[Model Research](#) (NASA SP-4103, 1985) by Alex Roland is now available on the Web. This book, in two volumes, is a history of the National Advisory Committee for Aeronautics (NACA). Though it is nearly 20 years old, it is an exciting and impressive look into the organization that, during its time, set the standard for aeronautical research. Thanks to volunteer Chris Gamble for formatting the book for the Web.